

## RE: Cumulative Exposure Calculations

**Krista Christensen** to: Brattin, Bill

01/08/2013 08:41 AM

From: Krista Christensen/DC/USEPA/US

To:

Cc: Bob Benson/R8/USEPA/US@EPA, David Berry/R8/USEPA/US@EPA, Leonid Kopylev/DC/USEPA/US@EPA, Thomas Bateson/DC/USEPA/US@EPA

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Hi Bill-

Yes, I think that makes sense under the assumption that we assign the xray date of June 1, 1980 to everyone; as you say, this means only one day of exposure in the summer season. Although that's not the actual date of xray, guess we have to draw the line somewhere...anyway, I changed my code to reflect this change (below) and now see the same cum exp calculations as you found, out to 4 places after the decimal point.

```
if year=xray_year and season > xray_season then delete; <-- OLD
if year=xray_year and season >= xray_season then delete; <-- NEW
```

The same change applies to the lagged exposure calculations:

```
if year<(xray_year-&i) or (year=(xray_year-&i) and season <= xray_season);
<-- OLD
if year<(xray_year-&i) or (year=(xray_year-&i) and season < xray_season);
<-- NEW
```

Thanks for investigating--I just wanted to make sure that I understood the calculations. Also thank you for contacting UC regarding the smoking data; it would be great if the pack-year and duration information could be used, in addition to the ever/never variable!

Krista

"Brattin, Bill" ---01/08/2013 10:15:26 AM---[attachment "Calc Check with Krista.xlsx" deleted by Krista Christensen/DC/USEPA/US] Krista

From: "Brattin, Bill" <brattin@srcinc.com>  
To: Krista Christensen/DC/USEPA/US@EPA  
Cc: Bob Benson/R8/USEPA/US@EPA, David Berry/R8/USEPA/US@EPA  
Date: 01/08/2013 10:15 AM  
Subject: RE: Cumulative Exposure Calculations

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[attachment "Calc Check with Krista.xlsx" deleted by Krista Christensen/DC/USEPA/US]  
Krista

As shown in the attached Excel file, it looks to me like your calculations are including one extra season at the end (1980.2 = summer).

The assumed day of the X-ray is 6/1/1980, which (strictly speaking) is in the second season of 1980, but there is only one day (maximum) of exposure in this season.

I think only the first season (1980.1 = spring) should be included.

We would probably agree on our calcs if the X-ray date were assumed to be 5/31/1980 (one day earlier).

Let me know if you agree this is the source of the discrepancy, and if you agree that that the second season (6/1/1980 to 8/31/1980) should be excluded.

In re the smoking data, I have asked UC to send a new file with smoking data for all 513 workers. I assume this will be declared to be the "gold standard" data set for investigating smoking. However, I have not received it yet. I will send as soon as it arrives.

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From: Christensen.Krista@epamail.epa.gov [mailto:Christensen.Krista@epamail.epa.gov]  
Sent: Tuesday, January 08, 2013 5:09 AM  
To: Brattin, Bill  
Cc: Benson.Bob@epamail.epa.gov; Kopylev.Leonid@epamail.epa.gov; Bateson.Thomas@epamail.epa.gov  
Subject: RE: Cumulative Exposure Calculations

Hi Bill-  
Thanks for your reply. I've attached here an excel file which shows my cum exp estimates and those that were in the excel file sent by Bob. I selected one (ID 10162) as an example (sheet 2), showing the exposure values included in the cum exp calculation.

Krista

From: "Brattin, Bill" <[brattin@srcinc.com](mailto:brattin@srcinc.com)>  
To: Krista Christensen/DC/USEPA/US@EPA  
Cc: Bob Benson/R8/USEPA/US@EPA  
Date: 01/07/2013 07:13 PM  
Subject: RE: Cumulative Exposure Calculations

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Krista

I talked to Bob about this and we think the best thing is for you and me to work it through to uncover the discrepancy in our calcs.

Since I have a hard time reading SAS code, let's just pick one example worker where you have detected a discrepancy, and look at the raw data (exp0osure conc by season) and then see if we agree on what values should get added to

produce the unlagged and the lagged CE values. Then, we can both check our calcs to be sure they are doing what we want.

\*\*\*\*\*

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From: [Christensen.Krista@epamail.epa.gov](mailto:Christensen.Krista@epamail.epa.gov) [<mailto:Christensen.Krista@epamail.epa.gov>]  
Sent: Monday, January 07, 2013 8:35 AM  
To: [Benson.Bob@epamail.epa.gov](mailto:Benson.Bob@epamail.epa.gov); Brattin, Bill; [Berry.David@epamail.epa.gov](mailto:Berry.David@epamail.epa.gov)  
Cc: [Bateson.Thomas@epamail.epa.gov](mailto:Bateson.Thomas@epamail.epa.gov); [Kopylev.Leonid@epamail.epa.gov](mailto:Kopylev.Leonid@epamail.epa.gov)  
Subject: Fw: Cumulative Exposure Calculations

Hi Bob-

I was looking over the new exposure estimates you sent a couple weeks ago, and thought I'd try to recreate the cum and lagged cum exposure values from the season-level data, to ensure I understood how they were calculated. The unlagged cum exp estimates from my calculations identical to those in the excel file you sent for subjects with xray in 2000's, but slightly different for those with xray in 1980 (which leads me to think it's not a rounding issue). The lagged cum exp estimates are slightly different across the board.

Were the estimates in the excel file generated using day-level data (or other), or based solely on the season/year-level data? I think the difference is likely due to how the lags are taken, but not quite sure where the discrepancy would lie. I've attached my SAS program in case that is helpful.

Thanks!  
Krista

From: Bob Benson/R8/USEPA/US  
To: Thomas Bateson/DC/USEPA/US@EPA, Krista Christensen/DC/USEPA/US@EPA, Leonid Kopylev/DC/USEPA/US@EPA  
Cc: [brattin@srcinc.com](mailto:brattin@srcinc.com), David Berry/R8/USEPA/US@EPA  
Date: 12/26/2012 12:40 PM  
Subject: Cumulative Exposure Calculations

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Attached are spreadsheet that have the data for cumulative exposure based on GM and AM approaches. The calculations are all based on the 899 IH data (duplicates for 1977 for Track Unload were removed, but the GM JEM prepared originally by UC did not change) and the corrected seasonal adjustment factors.

Here is the original spread sheet from UC with the data by season and year for the 513 workers. One tab is based on GM, the other tab is based on AM.

[attachment "Worker exposure by season 12-20-2012.xlsx" deleted by Krista Christensen/DC/USEPA/US]

Bill prepared the two spreadsheet below. The data were narrowed to 434 workers based on the selection criteria described in the tab. The files show cumulative exposure for each of the 434 workers with lags of 0, 5, 10, 15, and 20 years. One file is based on GM, the other is based on AM.

[attachment "GM Data for Fitting NCEA Copy.xlsx" deleted by Krista Christensen/DC/USEPA/US]

[attachment "AM Data for Fitting NCEA Copy.xlsx" deleted by Krista Christensen/DC/USEPA/US]

I am in the office today. I will be out Dec 27, Dec 28 and will return Jan 2. Call me (303-312-7070) or Bill (home, 303-697-6593) if you have questions about the data sets.